WHAT IS CLAIMED IS:

1. A track pin bushing for cooperating with a track pin in an endless track, the track pin bushing comprising:

a tubular body formed of an iron-based alloy with a first end and a second end, an outer surface that is case-hardened in at least a section thereof, and an inner surface having an inner diameter, wherein the inner diameter defines the circumference of an axial bore extending from the first end to the second end and at least a portion of the case hardened section has been removed to a depth sufficient to expose a non-carburized layer of the iron-based alloy; and

a wear-resistant coating metallurgically bonded to said non-carburized layer, the wear-resistant coating comprising a fused, hard metal alloy comprising at least 60% iron, cobalt, nickel, or alloys thereof.

2. The track pin bushing of claim 1, wherein said portion of the case-hardened outer surface that has been removed corresponds to a contact surface adapted to engage with a drive sprocket in the endless track of a track-type machine.

3. The track pin bushing of claim 1, wherein a Vickers hardness of the wear-resistant coating is greater than 950 HV.

4. A track pin bushing for cooperating with a track pin in an endless track, the track pin bushing comprising:

a first end and a second end;

an inner surface having an inner diameter, wherein the inner diameter defines the circumference of an axial bore extending from the first end to the second end;

an outer surface having a first outer diameter at a first end section and a second end section and a second outer diameter at a middle section therebetween, wherein the second outer diameter is greater than the first outer diameter;

an annular groove located in at least a portion of said middle section and extending over a majority of an axial length of said middle section; and

a wear-resistant coating disposed in said annular groove and metallurgically bonded to the track pin bushing, the wear-resistant coating comprising a fused, hard metal alloy comprising at least 60% iron, cobalt, nickel, or alloys thereof.

5. The track pin bushing of claim 4, wherein the wear-resistant coating has an outer surface flush with the outer surface of the track pin bushing.

6. The track pin bushing of claim 4, wherein the track pin bushing is an iron-based alloy and at least one of the first end, second end, inner surface, first section and second section is case hardened.

7. The track pin bushing of claim 4, wherein the track pin bushing is an iron-based alloy and at least the middle section in which the annular groove is not located is carburized and quenched and the annular groove has a depth sufficient to expose a non-carburized layer of the iron-based alloy.

8. The track pin bushing of claim 4, wherein the wear resistant coating has a thickness of approximately 1.5 mm.

9. A method for hardfacing with a wear-resistant coating a metal surface of a carburized metal part, the method comprising the steps of:

removing the carburized metal from at least a portion of the metal surface to a depth sufficient to expose a non-carburized layer of the metal, the portion defining an area to be coated;

coating the area with a slurry comprising a fusible, hard metal alloy with at least 60% iron, cobalt, nickel, or alloys thereof in the form of a finely divided powder and polyvinyl alcohol; and

forming a metallurgical bond between the area and the coated slurry to form the wear-resistant coating.

10. The method of claim 9, wherein the step of removing comprises one or more of machining, lathing, grinding, and polishing.

11. The method of claim 9, further comprising a step of:

adjusting a thickness of the coated slurry to an unfused thickness of from 1.67 to 2.0 times a final (i.e., fused) thickness of the wear-resistant coating.

12. The method of claim 9, wherein the step of forming a metallurgical bond comprises drying the coated slurry, heating the metal part to a fusion temperature of the fusible, hard metal alloy in a controlled atmosphere of at least one inert gas or reducing gas excluding nitrogen, and cooling the metal part to ambient temperature.

13. The method of claim 9, further comprising subsequently quenching the carburized metal part to case harden the carburized metal that remains after the step of removing such that a non-coated surface has an increased hardness as compared to the carburized metal.

14. The method of claim 9, wherein the metal part is a component of an endless track or a component of an undercarriage in a track-type machine.

15. The method of claim 14, wherein the metal part is a track pin bushing.

16. A method for hardfacing a metal surface of a track pin bushing with a wear-resistant coating, the track pin bushing comprising an outer surface having an outer diameter, an inner surface having an inner diameter, a first end and a second end, wherein the inner diameter defines the circumference of an axial bore extending from the first end to the second end and cooperating with a track pin in an endless track, the method comprising the steps of:

carburizing at least a portion of the track pin bushing to produce a surface having a carburized depth;

preparing at least a portion of the carburized surface of the track pin bushing in an area to be coated by removing the carburized metal to a depth sufficient to expose a decarburized layer;

coating the exposed decarburized layer of the track pin bushing with a slurry comprising a fusible, hard metal alloy with at least 60% iron, cobalt, nickel, or alloys thereof in the form of a finely divided powder and polyvinyl alcohol;

forming the wear-resistant coating by metallurgically bonding the exposed decarburized layer and the slurry; and

case hardening a non-prepared and carburized surface of the track pin bushing by quenching.

17. The method of claim 16, further comprising a step of adjusting a thickness of the slurry to have an outer surface that is concentric with the axial bore, wherein the thickness of the concentric slurry coating is from 1.67 to 2.0 times a final thickness of the wear-resistant coating.

18. The method of claim 16, wherein the depth is at least 3 mm.

19. The method of claim 16, wherein the step of preparing comprises removing by one or more of machining, lathing, grinding, and polishing.

20. The method of claim 16, wherein the step of forming the wear-resistant coating by metallurgical bonding comprises drying the slurry, heating the metal surface of the track pin bushing to a fusion temperature of the fusible, hard metal alloy in a controlled atmosphere of at least one of an inert gas or a reducing gas excluding nitrogen, and cooling the track pin bushing to ambient temperature.

21. The method of claim 16, wherein the non-prepared and carburized surface is at least one of the inner surface of the track pin bushing, the first end of the track pin bushing, and the second end of the track pin bushing.

22. A method for hardfacing a metal surface of a track pin bushing with a wear-resistant coating, the method comprising:

forming the track pin bushing having a first end and a second end, an inner surface having an inner diameter, wherein the inner diameter defines the circumference of an axial bore extending from the first end to the second end, an outer surface having a first outer diameter at a first end section and a second end section and a second outer diameter at a middle section therebetween, the second outer diameter being greater than the first outer diameter;

carburizing the track pin bushing to produce a carburized outer surface, inner surface and first and second end sections, each with a carburization depth;

removing carburized steel from at least a portion of said middle section to reduce the second diameter by at least the carburization depth,

coating said middle portion in the area of the reduced diameter with a slurry comprising a fusible, hard metal alloy with at least 60% iron, cobalt, nickel, or alloys thereof in the form of a finely divided powder and polyvinyl alcohol;

adjusting a thickness of the slurry to have an outer surface that is concentric with the axial bore, wherein the thickness of the concentric outer surface is from 1.67 to 2.0 times a final thickness of the wear-resistant coating;

forming the wear-resistant coating by metallurgically bonding said portion of said middle portion and the slurry; and

case hardening at least the inner diameter and first and second ends.

23. The method of claim 22, wherein the carburization depth is approximately 3.0 mm.

24. The method of claim 22, wherein the step of removing comprises one or more of machining, lathing, grinding, and polishing.

25. The method of claim 22, wherein the step of forming the wear-resistant coating by metallurgical bonding comprises drying the slurry, heating the metal surface of the track pin bushing to a fusion temperature of the fusible, hard metal alloy in a controlled atmosphere of at least one of an inert gas or a reducing gas excluding nitrogen, and cooling the track pin bushing to ambient temperature.

26. A track pin bushing in combination with a track pin for connecting adjacent track links in an endless track of a crawler track, the track pin bushing including an axial bore therethrough in which is positioned the track pin, the track pin bushing comprising:

a tubular body formed of a case hardened iron-based alloy with a first end and a second end, an outer surface, and an inner surface having an inner diameter, wherein the inner diameter defines the circumference of the axial bore extending from the first end to the second end and a portion of the outer surface has been removed to a depth sufficient to expose a non-carburized layer of the iron-based alloy; and

a wear-resistant coating metallurgically bonded to said portion, the wear-resistant coating comprising a fused, hard metal alloy comprising at least 60% iron, cobalt, nickel, or alloys thereof.